



U.S. DEPARTMENT OF
ENERGY

Office of
**ENERGY EFFICIENCY &
RENEWABLE ENERGY**

The U.S. Department of Energy's Role in Marine Energy

What We Do

Marine energy, also known as Marine and Hydrokinetic (MHK) technologies, convert the energy of waves, tides, and river and ocean currents into electricity and have the potential to provide millions of Americans with locally sourced, clean, and reliable energy. Additionally, marine energy has the potential to provide cost-effective energy for numerous existing distributed and alternate applications in nongrid connected or remote, coastal areas—including military bases and smaller communities—where electricity costs are high.

Marine energy technologies could be used to efficiently and cost-effectively power ocean observation technologies, such as sensors and data acquisition equipment.

The U.S. Department of Energy (DOE) Water Power Technologies Office is advancing cutting-edge technology with research and investments to drive U.S. leadership in marine energy—tidal, wave, ocean current, and ocean thermal energy conversion—with the goal of delivering low-cost, reliable power and resiliency to the nation's electricity grids.

Types of Funding

COMPETITIVELY SELECTED AWARDS

Competitive awards of discretionary grants or cooperative agreements with industry, academic, or national laboratory partners through funding opportunity announcements are available at eere-exchange.energy.gov.

DOE ADVANCED RESEARCH PROJECTS AGENCY-ENERGY

Funds short-term, technology-focused, applied R&D aimed at creating real-world solutions to important problems in energy creation, distribution, and use. The agency advances high-impact energy technologies that are too early for private-sector investment but have the potential to radically improve U.S. economic security, national security, and environmental well-being. arpa-e.energy.gov/?q=programs/apply-for-funding

NATIONAL LABORATORY FUNDING

Direct funding proposals for early-stage research by national laboratories are merit-reviewed by subject matter experts and are selectively competed.

SMALL BUSINESS INNOVATION RESEARCH (SBIR)

Enables small businesses to explore their technological potential and provides incentives to profit from its commercialization. science.energy.gov/sbir/

DOE OFFICE OF TECHNOLOGY TRANSITIONS TECHNOLOGY COMMERCIALIZATION FUND (TCF)

The TCF leverages the R&D funding in DOE's applied energy programs to advance energy technologies with the potential for high impact. These funds are matched with funds from private partners to promote promising energy technologies with the goal of increasing the commercialization and economic impact of energy technologies developed at DOE's national labs. energy.gov/technologytransitions/services/technology-commercialization-fund

SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) PROGRAM

The Small Business Administration's STTR program funds collaborative efforts between small businesses and research institutions with the goal of transferring technologies and products from the laboratory to the marketplace. STTR bridges the gap between the performance of basic science and the commercialization of resulting innovations. Five federal agencies, including DOE, participate in the program, soliciting grant proposals from small businesses and making awards on a competitive basis. science.energy.gov/sbir/

FACILITIES

Marine Energy Research Centers

DOE supports a number of national marine renewable energy centers. Three of these centers were competitively selected and launched at U.S. universities, each with unique research and testing capabilities to address the most pressing questions for new marine energy technology development. A new grid-connected, full-scale marine test facility, PacWave, is being constructed off the coast of Newport, Oregon, and is expected to begin initial operation in the coming years.

HAWAII NATIONAL MARINE RENEWABLE ENERGY CENTER (HINMREC)

HINMREC facilitates the development of commercial wave energy systems. HINMREC assisted the U.S. Navy in the implementation of a grid-connected wave energy test site at Marine Corps Base Hawaii in Kaneohe, and its Wave Energy Test Site allows developers to prove their devices and generate the necessary data to advance designs toward commercial readiness. HINMREC also assists the private sector in moving ocean thermal energy conversion systems beyond proof of concept to precommercialization. The technical role of the center is primarily focused on system and component engineering and local and global environmental studies.

hinmrec.hnei.hawaii.edu

PACIFIC MARINE ENERGY CENTER (PMEC)

PMEC, a consortium of the University of Washington, Oregon State University, and University of Alaska Fairbanks, facilitates commercialization of marine energy technology, informs regulatory and policy decisions, and closes key gaps in scientific understanding with a focus on student growth and development. PMEC's project objectives include optimizing individual marine energy devices and arrays to increase energy capture, improve reliability, and decrease cost of energy; evaluating potential environmental, ecosystem, and human interactions with marine energy technologies; facilitating and conducting research to inform adaptive management of marine energy technologies; improving forecasting, characterization, and assessment of marine energy resources; and developing integrated, standardized facilities to serve U.S. and international developers of wave, tidal, and in-river energy devices.

pmec.us

SOUTHEAST NATIONAL MARINE RENEWABLE ENERGY CENTER (SNMREC)

SNMREC advances the science and technology of implementing marine renewable energy recovery. A core focus of work is resource assessment, which includes oceanic measurements of the Florida Current and of the thermal resources offshore of southeast Florida. SNMREC also addresses testing infrastructure development associated with the planning, fabrication, and deployment of equipment offshore to be used in at-sea tests of energy-generation prototypes. Environmental interactions research is another area of focus, which includes a wide range of projects to understand the effects of the marine environment on marine energy equipment at both the prototype stage and full-scale commercial deployments. snmrec.fau.edu

State-of-the-Art Facilities and Expertise Available to You

The national labs work with industry, government, academia, small businesses, international organizations, and nonprofits to advance the development and deployment of water power.

NATIONAL RENEWABLE ENERGY LABORATORY

www.nrel.gov/water

- Numerical modeling, control systems, and electric and mechanical design
- Wave and tidal device modeling and design capabilities for operational and extreme conditions
- Mechanical and electrical testing infrastructure

PACIFIC NORTHWEST NATIONAL LABORATORY

waterpower.pnnl.gov/mhk/

- Technology design, evaluation, and validation of environmental performance
- Marine energy resource characterization and environmental monitoring technology
- Knowledge management, synthesis, and dissemination via Tethys and the International Energy Agency

SANDIA NATIONAL LABORATORIES

energy.sandia.gov/energy/renewable-energy/water-power/

- Nonlinear controls development
- System design and testing
- Environmental modeling and cost analysis
- Resource characterization

Through DOE's Office of Technology Transitions, there are numerous ways to partner with the labs to access their unique capabilities, including:

- Cooperative research and development agreement
- Strategic partnership project
- Agreements for commercializing technology
- Technical assistance agreement
- User agreement
- Technology licensing agreement
- Material transfer agreement
- Small Business Innovation Research and Small Business Technology Transfer

energy.gov/technologytransitions/office-technology-transitions

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For more information, visit:
energy.gov/eere/water

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